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Examining the effect of banking performance on the economic growth of Saudi Arabia: A Panel ARDL Approach

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Abstract: This study examines the effect of banking performance on the economic growth of Saudi Arabia. The study employs panel autoregression distributed lag approach by considering 12 banks for the period between 2000-2018. The panel unit root analysis shows a mixed result of the stationary of the variable. The dynamic fixed effects (DFE) estimates show that bank performances as proxied by i.e., banks' asset and net interest margin have long-run and short-run effects on economic growth whereas the earlier one has more influence than the latter one. In addition to this, we also observed that oil price, as a control variable, has both long-run and short-run significant and positive relationship with country's economic growth. Thus, we recommend that banking regulation and its related policy should be supportive of the expansion of banking sector which has direct linkage with the economic growth of Saudi Arabia.

Keywords: Banking performance, economic growth, panel ARDL.

دراسة تأثير الأداء المصرفي على النمو الاقتصادي في المملكة العربية السعودية: منهجية الانحدار الذاتي (ARDL)

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المستخلص: تختبر هذه الدرا سة تأثير الأداء المصرفي على النمو الاقتصادي في المملكة العربية السعودية، وا ستخدمت الدرا سة منهجية الانحدار الذاتي من خلال النظر في الأداء المصرفي ل 12 بنكًا للفترة ما بين 2000-2018. اظهر تحليل جذر الوحدة للبيانات المقطعية نتائج مختلفة لسكون المتغير. أظهر تحليل تقديرات التأثيرات الثابتة الديناميكية (DFE) أن أداء البنوك ممثلاً بالأصول و صافي هامش الفائدة له تأثيرات طويلة وقصيرة المدى على النمو الاقتصادي بحيث أن الأول له تأثير أكبر من الثاني، كما لاحظنا أيضًا أن سعر النفط كمتغير متحكم له علاقة هامة وإيجابية على المدى الطويل والقصير بالنمو الاقتصادي للمملكة. وبالتالي؛ فإننا نوصي بضرورة أن تكون التنظيمات المصرفية والسيا سات المتعلقة بها داعمة لتو سع القطاع المصرفي الذي له ارتباط مباشر بالنمو الاقتصادي في المملكة العربية السعودية.

الكلمات المفتاحية: الأداء المصرفي، النمو الاقتصادي، نموذج الانحدار الذاتي.

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1. Introduction

Seminal literature on development studies examines the causes of economic growth rate fluctuations and evidence that this variation reflects the fluctuation in many interlinked and interconnected economic variables. The change in the value of one variable has multidimensional causality impacts and subsequent effects on other variables, resulting in economic fluctuation. Economic fluctuations are irregular and unpredictable and typically many macroeconomic variables fluctuate together (Mankiew, 2020).

Seminal research suggests that oil-price fluctuations have considerable consequences on the performance of an economy. These consequences are expected to be different in oil-producing countries based on the number of oil exports and an economy's dependency on oil revenues. Where an oil-price decrease is typically good news for oil-importing countries and bad news for oil-exporting countries, the reverse occurs when oil prices increase. For oil-exporting countries, the magnitude of oil price impacts is based on the oil price, the number of oil exports, and the share of oil revenues in GDP. A decrease in oil prices has an inverse impact on consumable income, contraction in government spending, and tighter fiscal measures. Additionally, changes in oil prices influence the performance of many other sectors such as transport, storage, electricity, power generation, and more, giving rise to indirect effects on economic activity.

The Kingdom of Saudi Arabia is heavily dependent on the revenues generated by oil exports and hosts a diversified portfolio of banking institutions including public, private, foreign, regional, and cooperative banks. Saudi Arabia is the largest oil exporter with 16% of the world's proven petroleum. The oil sector accounts for roughly 87% of budget revenues, 42% of GDP, and 90% of export earnings (World Fact Book, 2020). Oil is the main sponsor of government spending and development projects. The latest data shows that the Saudi economy shrank by 7% in the second quarter of 2020 due to a 61.8% plunge in the value of oil exports. The private and government sectors recorded negative growth rates of 10.1% and 3.5%, respectively (General Authority of Statistics, 2020).

The banking and financial sector is regarded as one of the key mediators in the economic growth and development process (Schumpeter, 1934 and 2008), and irrespective of a country's geopolitical policies and systematic composition, the banking sector is pivotal in stimulating economic activities. Banks act as the custodians of wealth and transform surplus economic resources into the essential factor of production demanded by firms and thus expand the economic size of countries. Banks provide a dynamic mechanism to keep the balance between the demand and supply of financial resources and grease the wheel of the economic process. The most important function of commercial banks is the process of increasing economic wealth, particularly the financial resources needed for raising the productivity of firms and industries. Therefore, in the context of economic growth theory, Schumpeter (1911) believes that financial institutions, especially banks, are useful instruments for improving the productive capacity of the economy. To some experts, variant growth rates across countries emerge on account of the state of their banking sector. The increasing importance of this sector has reinforced the general conviction that it is an important pillar of any economy and has

attracted the interest of academic researchers, investors, policymakers, and scholars in exploring the nexus between banking performance and economic growth. The Saudi banking sector exhibits an outlook of being well-capitalized, profitable, and having adequate liquidity (Hassan et al., 2017). Meanwhile, as the Saudi economy is largely oil-based, recent data shows varying real GDP growth rates due to fluctuations in oil prices. This indicates the substantial dependence on oil incomes that need to be substituted by other sectors. Recently, Saudi Arabia is going through a series of macro and microeconomic changes, consequently facing emerging challenges in all sectors including the banking sector. Therefore, there is a need to conduct empirical research to study the impact of oil-price volatility on the banking sector and economic growth.

Several studies have already examined the causal relationship between banking sector performance and economic growth. However, generally, most studies take the banking sector as a whole when studying the nexus between the banking sector and economic growth. To the authors' knowledge, the performance of individual banks performances and their nexus with economic growth has been ignored. This study seeks to fill this gap and enrich the existing literature by examining the causality connection of economic growth with individual bank performances and the relationship between economic growth.

The present paper extends the existing literature in two aspects. First, the relationship between oil-price fluctuations and real economic activity is assessed by using the panel auto-regression distributed lag (ARDL) approach. Second, unlike the existing literature which focuses on studying the banking sector as a whole, the present study examines individual bank performances and their relationship with economic growth. For this purpose, we use the increase and decrease in the values of individual banks' assets, net interest margin, and the stock price of banks' shares in the exchange markets to measure efficiency. As the Saudi economy is largely dependent on the revenues generated from oil exports, and the banking sector shares a significant part in the economic sector, it is assumed that oil-price changes and banking performance considerably affect economic growth.

This study is organized as follows: Section 2 provides the theoretical background and literature review. Section 3 describes the data and methodology. Section 4 provides the details of the analysis and results, and concluding remarks and suggestions in Section 5.

2. Theoretical Background and Literature Review

Existing literature has confirmed that there is a direct and positive relationship between the financial sector and economic growth. However, the causality relationship between the two sectors has been widely debated and controversial. Hicks (1969) claims that the financial system boosts the economic growth and development process. This is regarded as supply-leading because financial institutions provide more funds to support economic activities and that leads to banking credits resulting in economic growth. Similarly, King and Levine (1993a) also affirmed that financial development contributes to economic growth. On the contrary, as higher economic growth demands a higher need for financial credits, Goldsmith (1969) demonstrated that economic development

is the ground of financial development, regarded as demand-leading development.

The present study investigates the impacts of oil-price fluctuation and individual bank performance on the economic growth of Saudi Arabia. The study enriches the understanding of the Saudi banking industry through a broader range and more recent set of data. As the study has a twofold aspect, we review previous literature in two sections: firstly, we examine the literature dealing with the nexus between banking sector performance and economic growth; and secondly, we review the literature focusing on the relationship between oil prices and economic growth.

Nexus between oil-price fluctuations and economic growth

Since the first global oil crisis in 1970 due to the OPEC oil embargo, seminal studies were conducted to examine if the economic growth rate is attributed to oil prices. For this period, the majority of pioneering works were concerned with the US and Western economies, which indicated a negative or weak relationship between economic growth and the oil-price movement. Some of the noticeable works were Rasche and Tatom (1977), Darby (1982), and Hamilton (1983). Another instance of oil-price shock was experienced between 1999 and 2008. This instance was accompanied by global financial crises, which started mainly in the US and then spread globally.

In recent times, the works of Hamilton (2003), Hamilton and Herra (2004), Jiménez-Rodríguez and Sánchez (2004), Lee and Ni (2002), and Gadea et al. (2016) are of significant importance. Hamilton (2003) reported an impact relationship between oil prices and economic behavior in the US economy. While Jiménez-Rodríguez and Sánchez (2004) found evidence of a non-linear impact of oil price volatility on the real GDP of some Organization for Economic Co-operation and Development (OECD) countries. In particular, oil-price increases are found to have an impact on GDP growth of a larger magnitude than that of oil-price decline, with the latter being statistically insignificant in most cases. Among oil-importing countries, oil-price increases are found to harm economic activity in all cases except Japan. Gadea et al. (2016) evidenced a declining impact of the oil-price shock on GDP by employing a time-varying VAR. They also observed a greater negative effect of oil-price increases on GDP than the effect of oil-price decreases. While, Lee and Ni (2002), through VAR, found that for industries that have a large share of oil, such as petroleum refineries and industrial chemicals, oil price shocks mainly reduce supply. In contrast, for many other industries, like the automobile industry, oil-price shocks mainly reduce demand. They suggest that oil-price shocks influence economic activity beyond that explained by input cost effects possibly by delaying purchasing decisions of durable goods.

As observed above, most of the studies focused on the US and Western economies, while the literature focusing on the Saudi economy is short. Therefore, the present study aims to fill this gap and enrich the existing literature on the Saudi economy.

Nexus between bank performance and economic growth

Besides playing an important and mediatory role, the banking sector is considered a leading indicator of economic growth. Many studies have investigated the nexus between banking sector performance and economic growth. Some of the premier works are Schumpeter (1911), Gurley and Shaw (1955), Goldsmith (1969), and Hicks

(1969). Each has revealed that banking sector development has a major impact on real economic activity and growth. Similarly, multiple studies, such as King and Levine (1993), Demirguc-Kunt A. and Maksimovic (1998), and Levine & Zervos, (1998) confirmed the premier ones and suggested the impact of the financial sector on the growth of economies. Rehman (2018) examined the relationship between financial development and economic growth based on the bank and market-based systems. The bank-based system view aims to focus on the favorable support of banks in gathering capital, allocation of the financial venture, supervising the execution, and managing the risk level. Banks can persuade firms to share facts and follow obligations. Similarly, banks are better placed in offering funds to contemporary projects.

Interestingly, the approaches for studying the linkage between economic growth and financial development can be classified into three domains: firstly, the supply-leading approach that claims the supply of finance drives economic growth; secondly, the demand-leading approach that claims the demand for financial funds from industries and firm drives the financial sector's development; and finally, the feedback or bi-directional approach that claims there is a reciprocal relationship between the financial sector and economic growth where the growth of both sectors is mutually dependent.

The supply-leading approach advocates a market-based financial structure as the instrument for driving economic growth and a seminal series of work is found in this regard. Rousseau and Vuthipadadorn (2005) examined ten Asian economies from 1950-2000 by employing the vector autoregressive model (VARM) and vector error correlation model (VECM) to reveal the role of the financial sector in economic growth. The perspective was substantiated by revealing that many financial development variables drive economic growth in selected Asian countries (Hsue, He, & Tu, 2013). Similarly, in examining the relationship between financial development and economic growth of Korea and Thailand, Nasir et al. (2018) further affirmed this approach. Whereas, Amin and Hossain (2017) examined the link between the financial sector and economic growth in Bangladesh and discovered the causality relationship between them.

The contrary seminal works are found on the demand-following approach which considers economic growth as a prerequisite for the financial sector development and emphasizes economic growth as a driver of the financial sector's development. For example, examining the economies of seventy-four countries from 1961-1995 through panel data investigation, Zang and Kim (2007) found that economic growth is a prerequisite for financial development and leads to its growth. Similarly, Shan and Moris (2002), using the Toda and Yamamoto causality tools revealed the presence of causations running from economic growth to financial development for five out of nineteen member countries of the OECD.

In examining the causality impact between banking performance and real economic activities, many studies found a two-way or bi-directional relationship between bank-centric financial development and economic growth. In this connection, Demetriades and Hussein (1996) found a substantial indication of bi-directionality and a certain mark of reverse causation in the selected variables. Similarly, Luintel and Khan (1999) showed the mutual linkage between the financial sector development and economic growth for ten selected countries

by using the multivariate vector autoregression (VAR) structure. And by applying panel data cointegration and generalized method of moment (GMM) estimation, Rachdi and Mbarek (2011) found two-way causation between financial development and economic growth for selected countries from OECD member countries and the MEA region.

Although the Saudi economy is the largest in GCC and MENA, very few studies tried to examine the nexus between economic growth and individual bank performance. Masoud and Hardaker (2014) studied the Saudi economy from 1995-2013 and used the GMM approach to examine the linkage between economic growth and the stock market and the banking sector. They reported that the stock market and banking sector are instrumental in enhancing firms' growth. The study further revealed that firms that utilize equity finance develop faster than those that do not. Similarly, Masih, Al-Elg, and Madani (2009) applied vector error correction and variance decomposition methods for studying the Saudi economy and found one-way causality running from financial sector development to economic development and growth. Mahran (2012) further expanded the investigation period for the investigation from 1968-2010 with a combination of associated error correlation and the ARDL model. The study revealed that financial intermediation has undesirably influenced the real GDP in the long run. In examining the non-oil sector of the Saudi economy, Alghafais (2016) found a considerable influence of financial sector development on its total economic growth. This lack of studies on the Saudi economy motivates us to examine and explore the causal relationship between individual bank performances and real economic activities.

3. Data and Methodology:

This study uses unbalanced panel data from 12 Saudi commercial banks from 2000-2018 (a total of 202 observation). The Bloomberg database is extensively used to extract the panel data whereas the macroeconomic data are taken from the World Bank database. This study applies the panel ARDL technique based on dynamic fixed effects (DFE) to examine the cointegrating relationship of the variables. As a requirement of ARDL, all the variables under study must be stationary in either I(0) or I(1) or both orders (Pesaran 1997; Pesaran, Smith, and Shin 2001; and Pesaran et al. 2001). The dynamic heterogeneous panel estimation is estimated using the ARDL (p, q) method (p = lags of dependent variable and q = lags of independent variables). The equation 1 below presents the panel ARDL approach where equation 2 shows the panel ARDL with various series different lags which can be applied for standard cointegration test. In these equations, i=1,…..n is the bank index, t=1,…..T is the time index and ε_{it} appears as randon component.

$Y_{it} = \alpha it + ß'it\ Xit + \varepsilon it$ (1)
$Yit = \alpha it + \sum_{i=1}^{k} \delta_{ij}\ Yj,\ t\text{-}i\ \ Xit + \sum_{i=0}^{q} ß'it\ Xj,\ t\text{-}i + \varepsilon it$ (2)
$\Delta RGDPit = \alpha i + \sum_{j=1}^{m-1} ß_{ij}\ \Delta RGDPit\text{-}j + \sum_{l=0}^{n-1} \Phi_{il}\ \Delta\ NIMi,t\text{-}l + \sum_{r=0}^{p} Y_{ir}\ \Delta\ STOCKPi,t\text{-}r + \sum_{s=0}^{q} \theta_{is}\ ASSETi,t\text{-}s + \sum_{u=0}^{v} \pi_{iu}\ OILPi,t\text{-}u + \delta 1 RGDP\ it\text{-}1 + \delta 2 NIMi,t\text{-}l + \delta 3\ \Delta STOCKPi,t\text{-}1 + \delta 4\ ASSETi,t\text{-}1 + \delta 5\ OILPi,t\text{-}1 + \varepsilon 1 i,t\text{-}$ (3)

In the above equation 3, real GDP (RGDP) is considered the dependent variable whereas independent variables that proxy the banking performances include banks' net interest margin (NIM), banks' stock prices (STOCKP), banks' assets (ASSET) and the oil prices (OILP) as the control variable, Δ and $\varepsilon_{ki,,t}$ (k=1,2,3) appear as first difference operator and the error term. The subscript i shows a definite unit that is varied from 1 to N. We select AIC criteria for the optimal lag length of individual variables.

In line with the cointegration test approach proposed by Pesaran et al. (2001) for panel data, we can construct a null hypothesis as the absence of cointegration among the variables in Equation (1) such as $H_0= \delta_1 =\delta_2 =\delta_3 =\delta_4 =\delta_5$ against alternative hypothesis as the presence of cointegration, $H_0\neq 0$(k=1,2,3). These hypotheses are applied in the panel cointegration test under the panel ARDL method proposed by Pedroni (2004).

We estimate the long-run relationship of the variables when null hypothesis of co-integration is rejected, for instance, the long-run relationship in ARDL model as shown in Equation 1 can be formulated as follows:

$$RGDP_{it}=\xi_i + \sum_{j=1}^{m-1} \lambda_{1j}\ RGDP_{it\text{-}j} + \sum_{l=0}^{n-1} \lambda_{2j}\ NIM_{i,t\text{-}l} + \sum_{r=0}^{p} \lambda_{3j}\ STOCKP_{i,t\text{-}r} + \sum_{s=0}^{q} \lambda_{4j}\ ASSET_{i,t\text{-}s} + \sum_{u=0}^{v} \lambda_{5j}\ OILP_{i,t\text{-}u} + \nu_{1i,t} \quad (4)$$

The formation of Eq.5 enables to test the assumption i.e., the coefficients of the long-run relationship are the same for each bank, under the dynamic fixed effects (DFE) method. Following the same, the cointegration among the variables under the study i.e., five ARDL models can be tested. The next approach is to generate residuals from the estimation of following equations:

$$\Delta RGDP_{it}=\alpha_i + \sum_{j=1}^{m-1} ß_{ij}\ \Delta RGDP_{it\text{-}j} + \sum_{l=0}^{n-1} \Phi_{il}\ \Delta NIM_{i,t\text{-}l} + \sum_{r=0}^{p} \gamma_{ir}\ \Delta STOCKP_{i,t\text{-}r} + \sum_{s=0}^{q} \theta_{is}\ ASSET_{i,t\text{-}s} + \sum_{u=0}^{v} \pi_{iu}\ OILP_{i,t\text{-}u} + aECT_{t\text{-}1} + e_{1i,t\text{-}} \quad (5)$$

Where, the error terms $e_{ki,\,t}$ (k=1,2,3) is expected to distribute independently and normally with zero mean and equal variance, and $ECT_{t\text{-}1}$ symbolizes the error correction terms. The parameter of the above equation 3, ECT, shows the speed of adjustment to the equilibrium point. We adopt DFE estimator because of its restriction in short-term (except for intercept) as well as the estimation of long-term coefficients by providing necessary information on the speed of adjustment to achieve long-run equilibrium assumed to be identical for all cross-sectional units.

4. Estimated Results

Descriptive statistics

Table 1 exhibits the descriptive statistics of the dependent and independent variables used. The results exhibit the trend of banks' specific indicators (net interest margin, individual stock prices, and total value of bank assets) and RGDP and oil prices over 2000-2018. The statistics indicate that each of the variables (RGDP, NIM, STOCKP, ASSET and OILP) range between minimum values of 1365264,

0.01,0.001, 31.23, and 51110.16 with the maximum values of 2587758, 0.59, 150.11, 92.40, and 453389.9 with mean values of 2039475, 0.13, 23.44, 58.17, and 117883, respectively. The table also depicts the variation between the mean values and standard deviation of the variables. These deviations from their respective mean value indicate the presence of heterogeneity among the twelve commercial banks of KSA under study.

Table 1. Descriptive statistics

Variable	RGDP	NIM	STOCKP	Banking ASSET	Oil Prices
Mean	2039475	0.13	23.44	117883.0	58.17
Median	1980776	0.12	20.04	82463.89	53.61
Maximum	2587758	0.59	150.11	453389.9	92.40
Minimum	1365264	0.01	0.00	5110.16	31.23
Std. Dev.	412992	0.06	19.34	95684.28	20.61

N=202

Table 2: indicates a positive relationship between RGDP with NIM, STOCKP, ASSET, and OILP. This provides us with an initial indication regarding the contribution of banks' specific variables and oil prices with the economic growth of Saudi Arabia. Table 2 also shows the multicollinearity condition among the variables with the help of the variance inflation factor (VIF) and tolerance ratio. Both VIF and tolerance values of corresponding variables are falling within the acceptable level which is confirming the absence of multicollinearity among the variables. (Hair et al., 1995; Ringle et al., 2015).

Table 2. Correlation and Multicollinearity Analysis

Variable	RGDP	NIM	STOCKP	OILP	ASSET
RGDP	1				
NIM	0.24	1			
STOCKP	0.12	-0.31	1		
OILP	0.40	0.20	0.05	1	
ASSET	0.55	-0.12	0.30	0.21	1
VIF	0.87	1.27	1.13	1.18	1.48
Tolerance	1.15	0.79	0.88	0.85	0.68

Note: VIF=1/Tolerance; Tolerance=1/VIF

Panel unit root test

In addition to the various fundamental unit root tests like Augmented Dickey-Fuller (ADF) and Phillps-Perron (PP) tests, we employ two other types of panel unit root tests such as Levin, Lin, and Chu (2002) (LLCh), Im, Pesaran, and Shin (2003) (IPS), Breitung (2000), and Hadri (2000) to examine the stationaries of the series. These tests have the power to examine the condition of stationarity as they are applied as the first-generation test for panel unit root, for instance, the IPS test assumes the homogeneous property of autoregressive root as an alternative hypothesis.

Table 3. Panel Unit Root test

	Intercept & Trend							
Variable	**LLCh**		**IPS**		**ADF**		**PP**	
	Level	Δ	Level	Δ	Level	Δ	Level	Δ
RGDP	0.51	−9.98***	−1.00	−2.87***	33.45	51.33***	21.93	41.54**
NIM	−9.92***	−8.36***	−2.64***	−4.18***	43.58**	70.96***	41.67**	112.13***
STOCKP	−1.74**	−10.11***	−1.35*	−6.43***	32.31	105.17***	23.18	111.78***
ASSET	−0.83467	−5.72***	3.17	−5.65***	10.14	76.76***	5.26	64.08***
OILP	−0.58	−10.02***	0.08	−6.05***	16.30	81.60***	15.36	82.80***

Notes: In the panel unit roots probabilities are figured assuming asymptotic normality, a) test the hypothesis of the existence of unit root at an individual level, b) test hypothesis of absence of unit root at aggregate level*, ** and *** denotes the dismissal of the null hypothesis at 10%, 5%, and 1% significance level, respectively.

Table 3 displays the outcomes of four-panel unit root tests suggesting that NIM and STOCKP are stationary in their level form while ASSET and OILP are stationary in their first difference when IPS and LLCh panel unit root tests are applied. In contrast, only one variable (NIM) is found stationary in its level form while others are found stationary in their first differences once ADF and PP tests are considered. The panel unit root test thus provides a mixed result of stationary variables which are either in their level or in first differences form.

Cointegration property

We employ the Kao (1999) test (originally residual-based) and the Pedroni (1999, 2004) test, which is more diverse as it provides seven test statistics, to confirm the panel cointegration of the variables. We reject the null hypothesis (the t-statistics is –1.67 with a probability value of 0.05), and it suggests that GDP, NIM, stock prices, Asset, and OILP are panel cointegrated in the Saudi banking industry (Table 4).

Table 4: Results of the Kao cointegration test

Test Type	t−Statistic	Prob.
ADF	−1.665459	0.0479

Note: Null Hypothesis: No cointegration, Trend assumption: No deterministic trend, Automatic lag length selection based on AIC with a max lag of 1

Table 5 displays the Pedroni test outcomes and we have identified that four out of seven test results are in favor of rejecting the null hypothesis. These findings are consistent with Kao test outcome that provides strong statistical evidence for cointegration.

Table.5: Pedroni Residual Cointegration Test

Alternative hypothesis: common AR coefs. (within-dimension)				
Weighted				
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	-0.078458	0.5313	-3.439616	0.9997
Panel rho-Statistic	3.741286	0.9999	3.934854	1.0000
Panel PP-Statistic	-0.406115	0.3423	-4.082912	0.0000
Panel ADF-Statistic	-3.903341	0.0000	-7.133845	0.0000
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic	Prob.		
Group rho-Statistic	5.315044	1.0000		
Group PP-Statistic	-3.459757	0.0003		
Group ADF-Statistic	-5.167420	0.0000		

Note: Null Hypothesis: No cointegration; Trend assumption: Deterministic intercept and trend

Dynamic fixed effects (DFE) results

Tables 6 displays the result of the dynamic fixed effects (DFE) for the long-run and short-run relationship among RGDP, NIM, STOCKP, ASSET, and OILP. while banks' assets along with OILP both has positive and significant relationship with the economic grwoth. The ECT terms from the short-run estimation also show a quite satisfactory adjustment speed (19%) toward the convergence.

Table:6 Dynamic Fixed Effects Regression: Estimated Error Correction Form

Variables	Coef.	Std.Err.	z	P>z	[95% Conf.	Interval]
Long-run Estimates						
STOCKP	-0.027	0.040	0.680	0.498	0.105	0.051
ASSET	0.291	0.036	8.120	0.000	0.221	0.361
NIM	1.032	0.446	2.310	0.021	0.157	1.907
OILP	0.150	0.066	2.290	0.022	0.021	0.279
Short-run Estimates						
ECT	-0.192	0.046	4.130	0.000	0.283	0.101
D1.STOCKP	0.012	0.008	1.510	0.132	0.004	0.028
D1.ASSET	0.066	0.037	1.800	0.072	0.006	0.138
D1.NIM	0.053	0.146	0.360	0.715	0.233	0.340
OILP	0.029	0.009	3.090	0.002	0.011	0.047
CONSTANT	2.044	0.495	4.130	0.000	1.075	3.014

Note: All the variables except NIM are converted to the natural log from their respective level forms.

The long-run estimates from the dynamic fixed effects (DFE) provides some key findings of the banking performances and its relation with economic growth. According to the panel ARDL-DEF estimated results, we find that banks' assets, net interest margin (NIM) and oil prices are significant and contribute to economic growth in the long-run. More precicely, a 1% increse in banks' asset can lead to increase in RGDP by about 0.29%, on average, holding the effect of other variables constant. It implies higher the bank's assets higher the opportunity to expand economic activity through banks' financing and investing in the capital market. We also find that NIM and RGP both are signficant and positively related, indicating that a 1% increase in banks' NIM can lead to increase in RGDP by about 1%, on average, holding the effect of other variables constant. The net interset marigin which shows the banks performance in terms of profitabilty and it enusre that investiment in banking banks is profitable. Thus, higher the NIM, the higher the profitabity of banks in term of its long-run sustaniablity, which is also related to the financial flow and investment to the real sector by the banks and cause economic growth. Moreover, we observe a positive and significant relationship of oil price and economic growth of the country, to be more precise, a 1% increse in oil price is associated with the increase in RGDP by about 0.15%, on average, ceteris paribus. As an oil dependent economy, Saudi economic growth largely relies on its oil export revue which also correlated with higher oil price.

Table 7 shows only the significant outcomes from the Granger causality test where one-sided (unidirectional) causal relationships have been observed from RGDP to NIM, STOCKP to RGDP, OILP to RGDP, RGDP to ASSET which are based on F-statistics and its corresponding p-values.

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Table 7: Pairwise Granger Causality Tests

Relationship	F-Statistic	Prob.	Relationship	F-Statistic	Prob.
RGDP →NIM	3.05669	0.0496	NIM →RGDP	0.62593	0.5360
STOCKP →RGDP	6.07667	0.0028	RGDP →STOCKP	1.59549	0.2058
OILP →RGDP	6.95877	0.0012	RGDP→OILP	0.83614	0.4351
RGDP →ASSET	5.32691	0.0057	ASSET→RGDP	0.36298	0.6961

Note: With 2 lags

5. Conclusion and Recommendations:

The study aims to contribute to the literature of bank performance and economic growth in the context of Saudia Arabia. We employ a panel ARDL approach with data from 2000-2018 with a total of 202 observation. In examining the nexus between bank performance and economic growth, we use the net interest margin of banks, stock prices of banks, and total asset value of individual banks as independent variables and real GDP growth rate as the dependent variable. The study found correlation matrix and multicollinearity links among the independent and dependent variables, where it is noticed that there is a positive relationship among these variables. This result indicates that individual bank performances such as banks' assest and net interset marigin (NIM) both has positive impact on economic growth. For the panel unit, root analysis shows a mixed result of stationary the variable. At a further level, we applied dynamic fixed effects (DFE) estimators to study long-run and short-run relationships among the variables. The result shows that bank performance has long-run and short-run effects on economic growth. However, the long-run effects are greater than the short-run. Meanwhile, at individual variable to variable levels, the study shows mixed results of causality among the variables. These results reveal the unidirectional transmission relationship between individual bank performance and economic growth rate.

As the banking sector in Saudi Arabia is one the key players in the capital and financial markets, banking regulation should supportive of banking expansion for finanicng its real sector of the economy. As a biggest exporter of crude oil which is a major source of income, the policy makers should also need to adopt indigenous policies to limit the intensity of negative oil-price volatility and negative shocks. This can be achieved by adopting more economic diversification and searching for alternative oil revenues to maintain stable economic growth.

Nevertheless, the study has limitations too. The fundamental limitation of the study is the use of limited

independent variables to measure their impact on economic growth. Future studies can add more independent variables such as interest rate, money supply, aggregate demand, and money supply, alongside controlled variables like labor force, human capital, and trade openness. Furthermore, future studies could be extended toward differentiating the impact of global crude oil prices on stock indices of oil-exporting and oil-importing countries.

References

Alghafais, M. (2016). Comparative analysis: The impact of financial sector development on economic growth in the non-oil sector in Saudi Arabia. Riyadh: Saudi Arabian Monetary Authority.

Amin, S., & Hossain, R. (2017). Finance-growth nexus in Bangladesh: An empirical analysis. *Asian Economic and Financial Review, 7*(2), 152-163.

Barro, J. R. (1990). The stock market and investment. *The Review of Financial Studies, 3*(1), 115-131.

Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking & Finance, 28*(3), 423-442.

Binswanger, M. (2000). Stock return and real activity: is there still a connection? *Applied Financial Economics, 10*(4), 379-387.

Binswanger, M. (2004). Stock returns and real activity in the G-7 countries: did the relationship change during the 1980s? *The Quarterly Review of Economics and Finance, 44*(2), 237-252.

Darby, M. (1982). The price of oil and world inflation and recession. *American Economic Review, 72*(4), 738-751.

Demetriades, P., & Hussein, K. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of Development Economies, 51*(2), 387-411.

Demirguc-Kunt, & and Levine, R. (1996). Stock market development and financial intermediaries: Stylized facts. *The World Bank Economic Review, 10*(2), 291-321.

Demirguc-Kunt, A., & Maskimovic, V. (1998). Law, finance, and firm growth. *Journal of Finance, 53*(6), 2107-2137.

Fama, E. (1981). Stock returns, real activity, inflation, and money. *The American Economic Review, 71*(4), 545-565.

Fama, E. (1990). Stock returns expected returns and real activity. *The Journal of Finance, 45*(4), 1089-1108.

Gadea, M. D., Gómez-Loscos, A., & Montañés, A. (2016). *Oil Price and Economic Growth: A Long Story*. Madrid: BANCO DE ESPAÑA. doi:ISSN: 1579-8666 (on line)

General Authority of Statistics. (2020). *https://www.stats.gov.sa/sites/default/files/Press_release_GDP_Q2_2020_kpEN_0.pdf*. From http://www.stats.gov.sa: http://www.stats.gov.sa

Geske, R., & Roll, R. (1983). The fiscal and monetary linkage between stock returns and inflation. *The Journal of Finance, 38*(1), 1-33.

Goldsmith, R. W. (1969). *Financial Structure and Development.* Yale University Press.

Gurley, J., & Shaw, E. (1955). Financial Aspects of Economic Development. *45*(4), pp. 515-538.

Hamdi, H., Sbia, R., & Tas, B. (2014). Financial deepening and economic

growth in gulf cooperation council countries. *International Economic Journal*, *28*(3), 459-473.

Hamilton, J. (1983). Oil and macroeconomy since WW II. *Journal of Political Economy*, *91*, 228-248.

Hamilton, J. (2003). What is an oil shock? *Journal of Econometrics, 113*, 363-398.

Hamilton, J., & Herra, A. (2004). Oil shocks and aggregate macroeconomic behavior: The role of monetary policy. *Journal of Money, Credit, and Banking*(113), 265-286.

Hassan, M.-u., Nauman, K., Fouad, A. B., & Khokhar, I. (2017). Measuring the Performance of Islamic Banks in Saudi Arabia. *International Journal of Economics and Management*, 99-115.

Hicks, J. (1969). *A Theory of Economic History*. Oxford: Oxford University Press.

Hsue, S., He, Y. H., & Tu, C. H. (2013). Economic growth and financial development in Asian countries: A bootstrap panel Granger causality analysis. *Economic Modeling, 32*, 294-301.

Jiménez-Rodríguez, R., & Sánchez, M. (2004). *Oil price shocks and real GDP growth: Empirical evidence for some OECD countries*. Frankfurt, Germany: European Central Bank. DOI:id=533107

King R.G. and Levine, R. (1993). Finance and Growth: Schumpeter Might be Right. *The Quarterly Journal of Economics, 108*, 717-737.

King, R., & Levine, R. (1993 a). Finance and Growth: Schumpeter might be right. *Quarterly Journal of Economics*, *108*(3), 717-737.

Lee, B. (2012). Bank-based and market-based financial systems: Time-series evidence. *Pacific-basin Finance Journal*, *20*(2), 173-197.

Lee, K., & Ni, S. (2002). On the dynamic effects of oil price shock: A study using industry level data. *Journal of Monetary Economics*, *49*(4), 823-852.

Levin, R., & Zervos, S. (1996). Stock market development and long-run growth. *World Bank Economic Review*, *10*(2), 323-39.

Levine, R. &. (1998). Stock markets, banks, and economic growth. *American Economic Review*, *88*(3), 537-558.

Luintel, K., & Khan, M. (1999). A quantitative reassessment of the finance growth nexus: Evidence from a multivariate VAR. *Journal of Development Economics*, *60*(2), 381-405.

M. N. Khan., M. F.-u. (2018). Efficiency measurement of Saudi Banking Industry: An Empirical Comparative Analysis. *Al-Shajarah Journal of International Institute of Islamic Thought and Civilization*, 111-134.

Mahran, H. (2012). Financial intermediation and economic growth in Suadi Arabia: An empirical analysis, 1968-2010. *Modern Economy, 3*(5), 626-640.

Mankiw, G. (2020). *Principles of Economics*. Hampshire, UK: CENGAGE.

Masih, M., Al-Elg, A., & Madani, H. (2009). Causality between financial development and economic growth: An application of vector error correction and variance decomposition methods to Saudi Arabia. *Applied Economics*, *41*(13), 1691-1699.

Masoud, N., & Hardakar, G. (2014). Stock market development, banks and firms growth in Saudi Arabia: Empirical evidence from Saudi Arabia. *International Journal of Economics and Finance*, *6*(6), 159-180.

Moayad, A., Alsabban., S., & Alrafaj., O. (2019). *Does stock market performance affect economic growth? Empirical evidence from Saudi Arabia.* Riyadh: Saudi Arabian Monetary Authority. Retrieved February 15, 2020

Nasir, H., Majeed, S., & Aleem, A. (2018). Does Financial development lead to economic growth? Evidence from Emerging Asian Markets. *Asian Economic and Financial Review, 8*(5), 599-617.

Pradhan, R., Arvin, M., Norman, n., & Hall, J. (2014). The dynamics of banking sector and stock market maturity and the performance of Asian economies: Time series evidence. *Journal of Economic and Administrative Sciences, 30*(1), 16-44.

Rabiul, I. M. (2010). Bank, stock markets and economic growth: Evidence from selected developing countries. *Decisions, 37*(5), 5-29.

Rachdi, H., & Mbarek, H. (2011). The causality between financial development and economic growth: Panel data cointegration and GMM system approach. *International Journal of Economics and Finance, 3*(1), 143-151.

Rajabai, E., & Muhammad, J. (2014). The stock markets, banks and growth nexus: Asian Islamic countries. *Economic Notes, 43*(2), 137-165.

Rasche, R., & Tatom, J. (1977, May). The effects of the new energy regime on economic capacity, production, and prices. *Review, Federal Reserve Bank of St. Louis*, 2-12.

Rehman, M. Z. (2018). Banking sector development, stock market development, and economic growth: Evidence from Saudi Arabia. *Academy of Accounting and Financial Studies, 22*(4), 1-15.

Rioja, F., & Valve, N. (2014). The stock market, banks, and the sources of economic growth in low and high-income countries. *Journal of Economics and Finance, 38*(2), 302-320.

Rousseau, P., & Vuthipadadorn, D. (2005). Finance, investment, and growth: Time series evidence from 10 Asian economies. *Journal of Macroeconmics, 27*(5), 81-106.

Schumpeter, J. A. (1911). *The Theory of Economic Development.* Oxford: Oxford University Press.

Schumpeter, J. A. (1934 [2008]). The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle. Harvard University Press.

Schwert, G. (1990). Stock returns and real activity: A century of evidence. *The Journal of Finance, 45*(4), 1237-1257.

Shan, J. &. (2002). Does financial development 'lead' economic growth? *International Review of Applied Economics, 16*(2), 153-168.

World Fact Book. (2020, January 27). From Theodora.com: https://theodora.com/wfbcurrent/saudi_arabia/saudi_arabia_economy.html

Zang, H., & Kim, Y. C. (2007). Does financial development precede growth? Robinson and Luca might be right. *Applied Economics Letter, 14*(1), 15-19.